

PATENT COOPERATION TREATY  
PCT  
INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

REC'D 22 MAR 2005

PCT

Applicant's or agent's file reference 37336WOPOO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).	
International Application No. PCT/AU2003/001632	International Filing Date (day/month/year) 5 December 2003	Priority Date (day/month/year) 5 December 2002
International Patent Classification (IPC) or national classification and IPC Int. Cl. <sup>7</sup> B01D 65/08, B01D 65/02		
Applicant U.S. FILTER WASTEWATER GROUP, INC. et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheet(s).

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 30 June 2004	Date of completion of the report 3 March 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  M.R. O'LEY Telephone No. (02) 6283 2143

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/AU2003/001632

**I. Basis of the report****1. With regard to the elements of the international application:\***

- ☐ the international application as originally filed.
- ☒ the description, pages 1-15, as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☒ the claims, pages 17, 19-23, as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages , filed with the demand,  
pages 16, 18, received on 4 February 2005 with the letter of 4 February 2005
- ☒ the drawings, pages 1/9-9/9, as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

**4. ☐ The amendments have resulted in the cancellation of:**

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/AU2003/001632

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims 1-5, 7-16, 18-22, 26-27	YES
	Claims 6, 17, 23-25, 28-53	NO
Inventive step (IS)	Claims 1-5, 7-16, 18-22, 26-27	YES
	Claims 6, 17, 23-25, 28-53	NO
Industrial applicability (IA)	Claims 1-53	YES
	Claims	NO

**2. Citations and explanations (Rule 70.7)**

D1 WO,A,200018498 (USF FILTRATION AND SEPARATIONS GROUP INC)

D2 WO,A,19982806 (MEMTEC AMERICA CORPORATION)

D3 US,A,5639373 (MAILVAGAMAN ET AL)

The above documents disclose all the features of claims 6, 17, 23-25 and 28-53 of your application including the closed chamber, Therefore claims 6, 17, 23-25 and 28-53 are not novel and lack an inventive step.

CLAIMS:

1. A membrane module including a plurality of porous membranes extending in an array and mounted, at least at one end, in a header, said header having a number of  
5 distribution apertures for distributing a fluid into said module and along a surface or surfaces of said membranes, a chamber having one open end and another end in fluid communication with said distribution apertures for distributing said fluid to said distribution apertures.
- 2 A membrane module according to claim 1 wherein the chamber is elongate.
- 10 3. A membrane module according to claims 1 or claim 2 wherein the length of said chamber is greater than that required to provide a static head, when the membrane is immersed in a liquid and gas introduced into the chamber, equivalent to the head loss for the gas to flow to said distribution apertures.
4. A membrane module according to any one of the preceding claims wherein the  
15 fluid is gas.
5. A membrane module according to any one of claims 1 to 3 wherein the fluid is a mixture of gas and liquid.
6. [amended] A membrane module according to any one of the preceding claims wherein the chamber is enclosed on all sides.
- 20 7. A membrane module according to any one of preceding claims wherein the header or headers are mounted in a clover shaped manifold.
8. A membrane module according to any one of claims 1 to 6 wherein the header or headers are mounted in a linear, rectangular, square, or hexagonal manifold.

AMENDED

17. [amended] An assembly of membrane modules according to any one of claims 12 to 16 wherein the chamber is enclosed on all sides.

18. An assembly of membrane modules according to any one of claims 12 to 17 wherein the header or headers are mounted in a clover shaped manifold.

5 19. An assembly of membrane modules according to any one of claims 12 to 17 wherein the header or headers are mounted in a linear, rectangular, square, or hexagonal manifold.

20. An assembly of membrane modules according to any one of claims 12 to 19 wherein the chamber has a plurality of sides positioned to form a skirt directly beneath a  
10 header or plurality of headers

21. An assembly of membrane modules according to any one of claims 12 to 20 when arranged in the form of an extended linear array wherein the chamber has enclosed long sides.

22. An assembly of membrane modules according to any one of claims 12 to 21 in the  
15 form of an extended linear array wherein the chamber has unenclosed short sides.

23. A method of removing a fouling material from a plurality of porous hollow fiber membranes mounted and extending longitudinally in an array to form a membrane module, the method comprising the steps of:

providing a source of gas to a chamber in fluid communication with said membrane  
20 module;

flowing the gas from the chamber into a base of the membrane module to form gas bubbles therein when said module is immersed in a liquid, whereby an upward flow of the gas bubbles across surfaces of the hollow fiber membranes is obtained, and whereby fouling materials are dislodged from the surfaces of the porous hollow fiber membranes.